

# ADMC HOT ideas

## Estimation with 2-digit addition and multiplication

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Hot Ideas for this edition provided by Janette Bobis, University of Sydney.

**E**stimation is an important skill for everyday living. Good estimators usually have a sound knowledge of basic facts, understand place value and use a variety of strategies to make their estimates. Before playing the following games, students should be familiar with some simple estimation strategies, such as, front-end rounding and rounding to the nearest ten. The following activity is designed to provide students with opportunities to practice their rounding strategies with addition and multiplication. In particular, the activity shows that estimates fall within limits and that sometimes, an exaggerated estimate will not be useful.

### Materials

Each pair of students needs

- 1 game sheet
- 1 calculator
- 1 pencil/pen

### Introducing the activity

Initially, you may need to demonstrate the rules of the game by 'challenging' a child or group of children in your class to a game. An overhead projection of the activity sheet could be used so the whole class can 'see' the numbers selected. Avoid 'telling' students your strategy for estimation. Instead, encourage them to 'discover' yours or their own strategies.

Highlight the fact that once all the numbers that could possibly win 3 points have been selected, players must look for number combinations that will win 2 points etc. Stress to the students that they must estimate mentally (no pencil and paper scribbles allowed) before using the calculator to verify the number of points scored.

### Developing thinking strategies through discussion and reflection

After the children have played the practice game, use the questions to initiate a discussion about their strategies for mentally estimating with 2-digit with addition and multiplication. Sharing strategies (such as rounding to the nearest ten, etc.) will help less able students to devise thinking strategies for themselves and will encourage more able students to reflect upon their own thinking strategies and realise that different strategies may also exist. Ask the children to record their strategies on the sheet. Allow the children to continue working through the games, but encourage them to 'try' some of the thinking strategies that they have just heard from their peers.

# Estimating with addition

Player A  
Score

## Instructions and practice game

Player B  
Score

Number of players: 2

Play with a partner. Circle two numbers to be added. Each number can only be chosen once. Add the numbers you have circled.

32 37 45 36 19 9 53 11 3 12  
18 49 3 16 23 29 42 17 33 43

Check with your calculator. Determine in which range the answer belongs and score the number of points listed below the number line. Record your score for each turn in the space provided.

0	20	40	60	80	100
<hr/>					
1 point	2 point	3 point	2 point	1 point	

The game is finished when all numbers have been selected once. The winner is the player with the highest score.

### Game 1

59 20 14 8 72 25 61 11 39 10  
17 51 24 41 4 22 12 39 45 38

### Game 2

48 21 7 46 26 19 59 18 8 47  
2 51 14 39 40 23 14 13 45 9

### Game 3

32 21 27 46 18 19 11 9 28 43  
18 10 34 41 32 13 28 1 57 8

1. What strategies do you use to help you score the greatest possible number of points?
2. Why do these strategies work?
3. Does your partner use a different strategy to yours? If so, how is it different to your own?

# Estimating with multiplication 1

Player A  
Score

## Instructions and practice game

Player B  
Score

Number of players: 2

Take it in turns to select one number from the top row and one from the bottom row. Chose numbers that when multiplied together have an answer somewhere between 0 and 500. Each number can only be chosen once.

33	39	57	48	78	93	61	87	73	97
4	5	3	6	7	3	5	8	2	4

Estimate the product of the numbers you have chosen. Check with your calculator.

Determine in which range the answer belongs and score the number of points listed below the number line. Record your score for each turn in the space provided.

0	100	200	300	400	500
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1 point	2 point	3 point	2 point	1 point	

The game is finished when all numbers have been selected once. The winner is the player with the highest score.

### Game 1

58	21	52	42	74	28	61	91	68	49
7	5	4	3	2	8	5	6	4	3

### Game 2

52	18	67	36	71	29	81	21	72	37
6	3	6	2	4	3	5	8	4	5

### Game 3

32	23	47	56	76	11	61	21	68	46
2	5	6	3	2	3	4	9	5	7

1. What strategies do you use to help you score the greatest possible number of points?
2. Why do these strategies work?
3. Does your partner use a different strategy to yours? If so, how is it different to your own?

## Estimating with multiplication 2

Player A  
Score

### Instructions and practice game

Player B  
Score

Number of players: 2

Take it in turns to select two numbers. Chose numbers that when multiplied together have an answer somewhere between 0 and 5000. Each number can only be chosen once.

58 21 57 46 71 19 61 11 68 47  
18 51 24 39 42 23 52 17 55 38

Estimate the product of the numbers you have chosen. Check with your calculator. Determine in which range the answer belongs and score the number of points listed below the number line. Record your score for each turn in the space provided.

0	1000	2000	3000	4000	5000
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1 point	2 point	3 point	2 point	1 point	

The game is finished when all numbers have been selected once. The winner is the player with the highest score.

### Game 1

58 21 57 46 71 19 61 11 68 47  
18 51 24 39 42 23 52 17 55 38

### Game 2

52 11 67 36 71 29 61 21 70 37  
8 31 44 29 48 23 52 17 45 33

### Game 3

38 23 47 56 76 11 61 21 68 46  
28 51 24 39 22 23 47 15 45 13

1. What strategies do you use to help you score the greatest possible number of points?
2. Why do these strategies work?
3. Does your partner use a different strategy to yours? If so, how is it different to your own?